

ABSTRACT OF THE DISCLOSURE

Passive emergency cooling in response to a loss of coolant accident (LOCA) in a PWR, having an integral reactor pressure vessel incorporating the steam generators and housed in a small high pressure containment vessel, is provided by
5 circulating cooling water through the steam generators and heat exchangers in an external tank to cool the reactor vessel at a rate sufficient to lower the pressure in the reactor vessel below that in containment to reverse mass flow out of the reactor vessel and keep the reactor core covered without the addition of makeup water. Suppression
10 tanks inside the small high pressure containment structure limit peak blowdown pressure in containment and provide flood-up water and gravity fed makeup water to cool the core. Diverse cooling is provided by natural circulation of air, and if needed, water, over the spherical containment structure.